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fort of Wood, and to the same Depth, in less than Eight or Nine Strokes.

XXXI. *Abstracts of the original Papers communicated to the ROYAL SOCIETY by Sigismund Augustus Frobenius, M. D. concerning his Spiritus Vini Æthereus: Collected by C. Mortimer, M. D. Secr. R. S.*

DR. *Frobenius* being dead, and some learned Chemists at *Paris*, in *Germany*, and in *Italy*, having endeavoured, in various Manners, and with different Contrivances, to make this *Æthereal Spirit*; I thought it would be acceptable to the Curious in *England*, to give them an Abstract of the Three Papers the Doctor communicated to the ROYAL SOCIETY concerning his *Spiritus Vini Æthereus*. The First he gave in on *Feb. 19. 1729-30.* along with what is printed in N^o 413. p. 283. of these *Transactions*, but was desired by the Author not to be published at that Time. In this Paper he says, you must “ take of
“ Oil of Vitriol, and the highest rectified Spirit of Wine,
“ equal Parts by Weight, not by Measure: That the
“ Oil of Vitriol was to be poured by little and little
“ into the Spirit of Wine, because they will grow hot
“ upon mixing; that they should be shaken often, that
“ they may mix thoroughly; then to be digested gently
“ in a glass Retort, and a large Receiver to be applied
“ and luted on, lest the subtil Spirits should fly away:
“ Then distil them in an *Athanas*, in gentle Digestion,
“ for Three Days; and pour back the distilled Liquor,
“ till

“ till the Liquor in the Recipient appears double, or of Two Sorts. Thus far he says, Sir *Isaac Newton* was acquainted with the Process *.”

He then proceeds almost in the very Words of the late Mr. *Godfry* [*Hanckewitz*] as printed in the *Transaction*, quoted above, p. 289.

He concludes, by telling us, that the First Part of the Process, till one comes to the Separation of the Two Liquors is mentioned by *Caneparius*, in his Book *de Atramentis*, first printed at *Venice*, and afterwards at *London*; then by the great Mr. *Boyle*; afterwards by Sir *Isaac Newton*: That Dr. *Stabl*, and Professor *Hoffmann*, were the first in *Germany* who knew the first Operation from *Kunckel*; but neither of them brought it to Perfection, or knew the Effects of it †. In *France* M. *Homberg* undertook an Experiment somewhat analogous to this, with Sulphur and Oil.

The Second Paper was communicated on the 12th of *February* 1740-1. in *Latin*, and contains an ample Account of the whole Process, with Improvements and Additions: But as the Author in his Third Paper, given in *Feb.* 19. 1740-1. in *English*, says that that is the truest and most advantageous Process, I shall present it to the Reader as follows, only subjoining the Differences and Additions in the Second Paper, by way of Note or Explication.

* So long ago as the Time of *Raymund Lully* this Process was in Use: See his *Epist. accurtatoria*, p. 327. and *Weidenfeld's* Secrets of the Adepts, p. 251.

† But Baron _____ at *Vienna*, knew the whole Process; and it is said *Frobenius* learned it of him.

TAKE Four Pounds in Weight of the best Oil of Vitriol, and as much in Weight (not Measure) of the best *Alcohol*, or the highest rectified Spirit of Wine.

1. First, pour the *Alcohol* into a chosen glass Retort; then pour in, by little and little, One Ounce of Oil of Vitriol; then shake the Retort, till the Two Liquors are thoroughly mixt, when the Retort will begin to grow warm; then pour in more of the Spirit of Vitriol, and shake it again; then the Retort will become very hot. Do not pour in the Spirit of Vitriol too fast, or too much at a time, lest the glass Retort, by being heated too suddenly, should burst: You must allow about an Hour's time for pouring in the Spirit of Vitriol, not pouring in above an Ounce at a time, and always shaking the Retort, till the whole Quantity of the ponderous mineral Spirit is intimately united with the light inflammable vinous Spirit.

2. In the next place, examine with your Hand the Heat of the glass Retort, and have a Furnace ready, with the Sand in the iron Pot, heated exactly to the same Degree as the Retort has acquired by the Mixture of the Two Liquors: Take out some of the Sand, and, having placed your Retort in the Middle of the iron Pot, put in the hot Sand again round the Retort, and apply a capacious Receiver to it; set it into cold Water, and wrap it over with double Flannel dipped in cold Water.

Raise your Fire gradually *, that the Drops may fall so fast, that you may count Five or Six between each,

* Force it from the Beginning with a pretty strong Fire, that not only the Spirit of Wine be carried over, but the Oil of Vitriol along with

each, and that beside this quick Discharge of the Drops, the upper Hemisphere of your Receiver appear always filled with a white Mist or Fumes : Continue this Heat as long as they emit the Scent of true Marjoram *.

As soon as the Smell changes to an Acid, suffocating one like that of Brimstone, take out the Fire, and lift the Retort out of the Sand, and change the Receiver ; for all that arises afterwards is only a mere *Gas* of Brimstone, and of no Use †.

If you do not use the greatest Precaution, the Liquors in the Retort will run over ; the Fire must cease, as soon as the æthereal Spirits are gone over ; for there remains behind an *Oleum Vini*, which is extracted by the Force of the Acid out of the Spirits, which will arise, run over, and often cause Explosions ||.

The

with it ; which will most certainly happen, if a middle Degree of Heat be kept up, between a reverberatory Heat and the other Degrees of Fire. For the Spirit of Wine being mixt with the vitriolic Acid in equal Weight, but by unequal Measure ; the Spirit taking up double the Room of the Oil, does in a wonderful manner make up the Deficiency of the highest Degree of Heat.

* Towards the End, the Scent will more resemble that of *Arrack* ; continue this Heat for about Three Hours, till the Scent becomes offensive, and like that of *Gas Sulphuris*.

† At this time you will see black Froth arising, which will certainly burst your Glasses, and destroy your Work, if continued.

|| The Retort with its Receiver being removed, set them by in a cold Place ; and when all are thoroughly cold, separate the Receiver from the Retort : There will be Two different Liquors in the Receiver, which pour off through a glass Funnel into a glass Bottle, which stop up very carefully.

The Liquor will be of Two Sorts ; that which swims at Top, inflammable, of the Nature $\tau\epsilon\ \Phi\lambda\omicron\gamma\iota\varsigma\epsilon\varsigma$; that which sinks to the Bottom, like

The Second Day, when your Glass is cold, infuse the Remainder, with half as much *Alcohol* *; and distil again as before, and you will have the same: The Third Day again, with as much, and proceed as at first, it gives it again. Go on as long as you can obtain any (of the æthereal Spirit) till all turns to a *Carbo*. Then separate it, and *alcalize* it with Spirits of *Salt Armoniac* made without Spirits of Wine, till all Effervescence ceases; and distil it once more *è Balneo Mariæ*: So is it ready for Experiments †.

There are more Products to be got from this Process; as, 1st, A balsamic Oil. 2^{dly}, A *Terra foliata Tartari* of a glittering Nature, not fusible, as is the common, prepared with Wine-vinegar, and fixt Salt, which is of great Use in Medicine: And, 3^{dly}, A purple Earth out of the *Caput Mort*.

The

like *Gas Sulphuris*, a sulphureous Acid. Separate the one Liquor from the other, by the separating Funnel (*per Tritoreum*).

* I suppose he means, pour in half as much fresh *Alcohol*, as you did at first, that is, Two Pounds Weight, to the Liquor remaining in the Retort.

† N. B. The above-mentioned Liquors are to be purified from the strong-smelling Sulphur, and superfluous Acid, which is performed in the following manner:

Pour the Liquor, which swam at Top, into a Phial; drop into it Drop by Drop successively, a sufficient Quantity of Spirit of *Sal Ammoniac*, prepared either from Salt Ammoniac with Quick-lime, or from Salt Ammoniac and Salt of Tartar, with common Water, and not with Spirit of Wine: Every Operator knows the Quantity; viz. continue dropping in of such Spirit upon the Liquor of the *Phlogiston*, till all Effervescence ceases, and all the acid Taste, with the sulphureous Smell, vanishes, being precipitated by the volatile *Alkali* to the Bottom.

3^{dly}, Let the whole Liquor be rectified in a fresh Retort by a most gentle Heat of a *Balneum Mariæ*, or of an Hand as hot as that of a Person in a Fever; and then keep it for Chemical Uses.

4^{thly},

The Doctor propos'd at some subsequent Meeting, to exhibit Four other simple *æthereal Spirits*, but of saline Origins, equally subtil with this *æthereal Spirit* of Wine.

Soon after this the Doctor died, and never discover'd any thing relating to these elementary *æthereal Liquors*; only in a Paper he left in my Hands, he gave these few Hints of their Nature.

There are Four Spheres open'd, one of the Earth, one of the Sea, one of the Air, and one of the Heaven.

4thly, The inferior Liquor is to be purified as well as that which swam on the Top, but it must be done by Oil of Tartar *per Deliquium*, till all Ebullition intirely ceases: By evaporating all the Humidity of this Liquor, you will have a peculiar *Terra foliata Tartari*, which, being reduced into a *Calx*, shines in the Crucible like oriental Pearls, or a Peacock's Tail. This Earth has nothing of a pungent Taste, and is to be esteemed as a Sheet-anchor in the most ardent Fevers.

N. B. This Earth is of diverse Colours, but it is not the common vulgar *Terra foliata* of Tartar; for it does not flow in the Fire, nor has the same Taste as the common. The common is made by pouring distilled Vinegar upon fixed Salt of Tartar, till an intire Saturation is made. The Uses of this were formerly known, and I know not by what Fate (says the Doctor) it is coming into Use again now. I thought proper to mention the Difference of these Preparations, because I am able, from innumerable Experiments, to demonstrate a real Diversity in them. I shall seem to have dwelt too long upon one thing, but I hope I shall be the less blamed, since I design to shew, that there are several *æthereal Liquors* besides this above-described; for there are not only such (*Φλογιστικά*, or) combustible Fluids, but there are likewise saline Liquors, and also some quite insipid, being a Mixture of Combustibles differently graduated, and extracted by no other Heat unless their internal Fire. In a word, as many Spheres as there are of the Elements, so many *æthereal*, or (if you rather chuse to call them so) *acreal Liquids*, *viz.* the *Æther* of the Earth, of the Water, of the Air, and of the Fire: Which, with the Leave of the ROYAL SOCIETY, I intend shortly to lay before them.

Whoſoever therefore knows how to extract the *Eſſences* out of Vitriol and Nitre, whoſe Centres are Salt, (and the Surface of the Earth is Salt),

1. Poſſeſſes the Salt of the Earth.
 2. The Salt of the Sea is made from the Sphere of the Sea, and common Salt.
 3. That of the Air is made of *Sal Ammoniac* and Salts of Vegetables.
 4. The Eſſence of Fire is made ſoon and eaſily from a concentrated Spirit of Wine, or of Vegetables. Thus the Four genuine Elements of Nature are obtained.
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XXXII. *An Account of the Fire-ball ſeen in the Air, and of the Exploſion heard, on Dec. 11. 1741. by the Right Honourable the Lord BEAUCHAMP, near London.*

ON *Friday* the 11th of this Month, being on the Mount in *Kensington* Gardens, at a Quarter paſt 10 o'Clock, the Sun ſhining bright, in a ſerene Sky, I ſaw towards the South, a Ball of Fire, of about Eight Inches Diameter, and ſomewhat oval, which grew to the Size of about a Yard and an half Diameter. It ſeemed to deſcend from above, and at the Diſtance of about half a Mile from the Earth, took its Courſe to the Eaſt, and ſeemed to drop over *Weſtminſter*. In its Courſe it aſſumed a Tail of Fourſcore Yards in Length; and before it diſappeared, it divided into Two Heads. It left a Train of Smoke all the Way as it went; and from the Place where it ſeemed